H0129-T/W



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Virtual Laboratories Everywhere

SDG#: H0129

### Recra LabNet Philadelphia **Analytical Report**

W.O. #: 10985-001-001-999

Date Received: 01-08,1





**INORGANIC CASE NARRATIVE** 

Client: TNU-HANFORD

**RFW#**: 9801L019,062

1. This narrative covers the analyses of 15 soil samples.

The samples were prepared and analyzed in accordance with the meth 2. attached glossary.

- 3. Sample holding times as required by the method and/or contract were met.
- 4. The cooler temperatures were recorded on the chain-of-custody.
- 5. The method blank for Cation Exchange Capacity (CEC) was within method criteria.
- 6. The Laboratory Control Samples (LCS) for CEC were within the laboratory control limits. The duplicate LCS was within the 20% Relative Percent Difference (RPD) control limit.
- 7. The replicate analysis for CEC was within the 20% RPD control limit, however the replicate analysis for Percent Moisture was outside the control limit.
- 8. Results for solid CEC samples are reported on a dry weight basis.

Vice President and Laboratory Manager

Lionville Analytical Laboratory

Date

njp\i01-019,062

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 21 pages.



#### **COVER PAGE - INORGANIC ANALYSES DATA PACKAGE**

**Date:** 02-19-98 **W.O.#:** 10985-001-001-9999-00

Laboratory Batch: 9801L019,062 Collection Dates: 12-

29,30,31-97

01-02,03,05,07-

98

SAMPLE NUMBER	LAB SAMPLE ID
вомло	9801L019-001
BOMJC4	9801L019-002
BOMJD6	9801L019-003
BOMJD9	9801L019-004
BOMJF5	9801L019-005
ВОМЈЈ3	9801L019-006
ВОМЈЈ6	9801L019-007
BOMJF8	9801L019-008
ВОМЈН1	9801L019-009
ВОМЈК2	9801L019-010
ВОМЈК5	9801L019-011
ВОМЈЈ9	9801L019-012
BOMJD3	9801L019-013
BOMJC7	9801L019-014
ВОМЈК8	9801L062-001

## WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	<u>ASTM</u>	<u>SW846</u>	OTHER
%Ash	<b>j</b> ø2216-80		
%Moisture	D2216-80		ILMO4.0 (e)
%Solids	<del>-</del> .		ILMO4.0 (e)
%Volatile Solids	D2216-80		
ASTM Extraction in Water	D3987-81/85		
BTU	D240-87		
CEC		<u>√</u> 9081	_ c
Corrosivity _by coupon _by pH		1110 (mod) 9045	
Cyanide, Total		9010	ILMO4.0 (e)
Cyanide, Reactive		_ Sec 7.3	
Density			_ b
Halides, Extractable Organic			_ EPA 600/4/84-008 (mod)
Halides, Total			EPA 600/4/84-008 (mod)
EP-Toxicity		_ 1310A	
Flash Point		1010	
Ignitability		1010	
Carbon, Total Organic (by LOI)			_ c
Oil and Grease		9071A	
Carbon, Total Organic		9060	Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	D240-87 (mod)	5050	
Petroleum Hydrocarbons, Total Re	coverable	9071	EPA 418.1 (mod)
pH, Soil		9045B	
Sulfide, Reactive		Sec 7.3	
Specific Gravity	_ D1429-76C		
Sulfur, Total		9056	
TCLP		1311	
TCLV		_ 1311	
Synthetic Precipitation Leach		1312	
Chlorine, Total		9056	
Paint Filter		9095	
Other:	Method:		<u>-</u>

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## METHOD REFERENCES AND DATA QUALIFIERS

#### **DATA QUALIFIERS**

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

#### **ABBREVIATIONS**

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

### **ANALYTICAL WET CHEMISTRY METHODS**

- ASTM Standard Methods.
- USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed., (1989).
- b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

RFW 21-21L-034/D-06/96

#### Recra LabNet - Lionville

#### INORGANICS DATA SUMMARY REPORT 02/19/98

CLIENT: TNU-HANFORD RECRA LOT #: 9801L019

WORK ORDER: 10985-001-001-9999-00

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
-001	BOMJD0	* Moisture	4.3	ŧ	0.01	1.0
		Cation Exchange Capacit	6.3 u	MEQ/1009	6.3	1.0
-002	BOMJC4	% Moisture	6.4	*	0.01	1.0
		Cation Exchange Capacit	7.8	MEQ/100g	6.4	1.0
-003	вомур6	* Moisture	3.8	ŧ	0.01	1.0
		Cation Exchange Capacit	6.2· u	MBQ/1009	6.2	1.0
-004	BOMJD9	* Moisture	3.3	*	0.01	1.0
		Cation Exchange Capacit	7.3	MBQ/100g	6.2	1.0
-005	BOMJF5	* Moisture	9.9	*	0.01	1.0
		Cation Exchange Capacit	11.9	MEQ/1009	6.7	1.0
-006	BOMJJ3	* Moisture	3.3	ŧ	0.01	1.0
		Cation Exchange Capacit	6.2 u	MBQ/1009	6.2	1.0
-007	BOMJJ6	* Moisture	2.3	ŧ	0.01	1.0
		Cation Exchange Capacit	6.1 u	MEQ/1009	6.1	1.0
-008	BOMJF8	% Moisture	3.2	*	0.01	1.0
		Cation Exchange Capacit	6.3	MEQ/1009	6.2	1.0
-009	вомлн1	* Moisture	3.0	*	0.01	1.0
		Cation Exchange Capacit	6.2 u	MEQ/1009	6.2	1.0
-010	вомјк2	* Moisture	7.5	*	0.01	1.0
		Cation Exchange Capacit	6.5 u	MEQ/1009	6.5	1.0

#### Recra LabNet - Lionville

#### INORGANICS DATA SUMMARY REPORT 02/19/98

CLIENT: TNU-HANFORD RECRA LOT #: 9801L019

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		EPORTING	DILUTION FACTOR
<b>二米世界市</b>		***************	*****		*******	******
-011	BOMJK5	* Moisture	6.6	•	0.01	1.0
		Cation Exchange Capacit	6.4 u	MEQ/100g	6.4	1.0
-012	BOMJJ9	* Moisture	2.6	*	0.01	1.0
		Cation Exchange Capacit	6.2 u	MEQ/100g	6.2	1.0
-013	вомутоз	* Moisture	3.6	•	0.01	1.0
		Cation Exchange Capacit	7.0	MEQ/100g	6.2	1.0
-014	BOMJC7	% Moisture	8.6	*	0.01	1.0
		Cation Exchange Capacit	9.3	MEQ/100g	6.6	1.0

#### Recra LabNet - Lionville

#### INORGANICS DATA SUMMARY REPORT 02/19/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9801L062

WORK ORDER: 10985-001-001-9999-00

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	Result	UNITS	LIMIT	FACTOR
	*************					
-001	BOMJK8	* Moisture	6.8	*	0.01	1.0
		Cation Exchange Capacit	6.4 u	MEQ/100	7 6.4	1.0



## Mountain States Analytical, Inc.

February 9, 1998

Mr. Kyle Clay RECRA Enviromental, Inc. 208 Welsh Pool Road Lionville, PA 19341

Reference:

Project: WHC/TMA 10985-001-001-9999-000

MSAI Group: 19448

Dear Mr. Clay:



Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

BOMJDO	BOMJC4	BOMJD6
BOMJD9	BOMJF5	BOMJJ3
BOMJJ6	BOMJF8	BOMJH1
BOMJK2	BOMJK5	BOMJJ9
BOMJD3	BOMJC7	BOMJK8

All holding times were met for the tests performed on these samples.

If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

W. Scott Fraser Project Manager

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#### **EXPLANATION OF SYMBOLS AND ABBREVIATIONS**

The following defines common symbols and abbreviations used in reporting technical data.

- 1. < means "less than." The number following the sign is the smallest amount which can be quantified using the specific test.</p>
- 2. > means "greater than.",
- N.D. means "none detected."
   BLOQ means "Below Limit of Quantitation " TNTC means "Too Numerous to Count."
- 4. MPN means "Most Probable Number." Used in reporting certain bacteriological results which are calculated from a statistical formula related to bacterial count observed in a series of dilutions of the sample.
- IU means "International units." Used in reporting results on certain Vitamin assays.
- 6. **CP Units** means "cobalt-chloroplatinate units." Used in reporting color of aqueous solutions.
- 7. umhos/cm means "reciprocal micromhs/cm or microsiemans." Used in reporting specific conductance of solutions.
- 8. NTU means "nephelometric turbidity units."
- fib>5 um/ml means 'fibers' greater than 5 mustons in length, per ml."
- 10. C and F represent degrees of temperature and refer to Celsius and Fanrenneit respectively.
- Cal means (diet) calories.
- 12. **Ib.** means pound (s).
- meq means milliequivalents, a chemical term meaning 1/1,000 of the equivalent weight of substance or element.
- 14. g means "gram(s)." The unit of weight used in the metric system. One gram equals about 1/30th of an ounce. kg means "kilogram(s)." One kilogram is 1,000 grams. mg means "milligram(s)." One milligram is 1,1,000 of a gram. ug means "microgram(s)." One-millionth of a gram.
- 15. I means "liter(s)." The unit of volume used in the metric system.
  mI means "milliliter(s)." One milliliter is 1/1,000 of a liter.
  ul means "microliter(s)." One microliter 1/1,000 of a milliliter or one/millionth of a liter.
- 16. m3 means "cubic meter(s)." Usually used as a lourne unit in air analyses.
- ppm means "parts per million." One ppm is equivalent to one microgram per gram, or one gram per million grams. For aqueous, liquids ppm is usually taken to be equivalent to milligrams per liter, because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.
- 18. ppb means "parts per billion." One ppb is 1.1 300 of a ppm.
- 19. % means "percent" or part per hundred. This is usually followed by the designation "by weight," meaning grams per hundred grams. If followed by the designation "by volume," it refers to volume per unit volume, e.g., milliliters per hundred milliliters.

Clients should be aware that a most important step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of the material involved, the test results will be meaningless. If you have any questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

WARRANTY AND LIMITATION OF LIABILITY. In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. We disclaim any other warranties, expressed or implied, including a Warranty of Fitness for particular Purpose and Warranty of Merchantability. We accept to legal responsibility for the purpose for which the client uses the test results. No purchase order or other order for work shall be accepted by the company with any conditions that vary from our Standard Terms and Conditions, if Mountain States Ar and all performs work requested by the client, canditions at variance to our Standard Terms and Conditions are not part of the contract.





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PRIPARENCE OF THE 108 Welsh For L Fort Lionville PA

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJDO Matrix: Solid

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Date	Reported:	D2, 19/9~
Disca	ard Date:	03/11/98
Date	Submitted:	01/26/98
Date	Sampled:	12/30/97
Lace	Damprea.	12/30/2

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	96.3	% Passing	0.1
	No. 4 Seive	63.1	% Passing	0.1
	No. 40 Seive	3.7	% Passing	0.1
	No. 200 Seive	1.0	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.43		0.001



This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted, Reviewed and Approved by:

Project Manager



Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msailabs.com





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The County Subtraction

FECKA Entry has to .08 Weish ick Lionville PA 1934

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985 001-001-9999-000

Sample ID: BOMJC4 Matrix: Solid

Al g HAI H A ate Febbred 1, 197 03/11/95 Di**s**card Date: Date Submitted: 01/26/98 Date Sampled: 12/29/97

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
			and the tea war	
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	<pre>% Passing</pre>	0.1
	1 Inch Seive	85.3	% Passing	0.1
	No. 4 Seive	66.9	% Passing	0.1
	No. 40 Seive	2.3	% Passing	0.1
	No. 200 Seive	1.5	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.51		0.001

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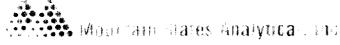
Respectfully Submitted, Reviewed and Approved by:

<u>Project Manager</u>



Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 · 1-800-973-6724(MSAI) · FAX 801-972-6278 e-mail: service@msailabs.com





and analysis of the

THORAL BOOLS INC. 198 Weish 255 Flag Lichville, PA 1984,

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001 001-9999 000

Sample ID: BOMJD6 Matrix: Solid

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· ···¡Aː	te eur	. 9448
Date	Report ed	/2 09/54
Disca	ard Date:	03/11/98
Date	Submitted:	01/26/98
Date	Sampled:	12/30/97

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	<pre>% Passing</pre>	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	96.2	% Passing	0.1
	No. 4 Seive	62.8	% Passing	0.1
	No. 40 Seive	6.4	% Passing	0.1
	No. 200 Seive	0.1	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.57		0.001

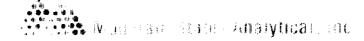
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Respectfully Submitted, Reviewed and Approved by:



Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msallabs.com





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Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJD9 Matrix: Solid

All TAL SOU 구기 및 원 .ate Reported 2/09/-03/11/99 Discard Date: Date Submitted: 01/26/98 Date Sampled: 12/31/98

Collected by:

Purchase Order: L01187

Project No.:

T+	Pura lumi a	Results as Received	Units	Limit of Ouantitation
Test	Analysis	as Received	OHICS	Quantitation
	<u> </u>			
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	89.8	% Passing	0.1
	No. 4 Seive	57.1	% Passing	0.1
	No. 40 Seive	0.2	% Passing	0.1
	No. 200 Seive	ND	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.61		0.001

The firstly and it

ND - Not detected at the limit of quantitation

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> Respectfully Submitted, Reviewed and Approved by:

Project Manager



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ALL SA District of A . A Weaph to see Dionville PA

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985 001-001-9999-000

Sample ID: BOMJF5 Matrix: Solid

HA E 1 -MAD Broup . 9443 lite Reported - (2/ )9/5 Discard Date: 03/11/94 Date Submitted: 01/26/98 Date Sampled: 12/31/98

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	97.1	% Passing	0.1
	No. 40 Seive	1.1	% Passing	0.1
	No. 200 Seive	0.2	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.38		0.001

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> Respectfully Submitted, Reviewed and Approved by:

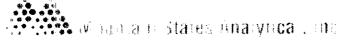
W. Scott Fraser

Project Manager



Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msailabs.com





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BITTA En liment of all 178 Welsh Had. 1934. Bronville PA 1934.

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJJ3 Matrix: Solid

A	. p :	4 : 5
TART	it up	9448
Date	Reported	2:39/
Disca	ırd Date:	03 - 11/10
Date	Submitted:	01/26/98
Date	Sampled:	12/31/98
	• .	

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
- <b></b>				
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	<pre>% Passing</pre>	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	99.5	% Passing	0.1
	No. 40 Seive	2.5	% Passing	0.1
	No. 200 Seive	0.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.55		0.001

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Respectfully Submitted, Reviewed and Approved by:

W. Scott Fraser Project Manager

O s of Quality

Corporate Office
1645 West 2200 South, Sait Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278
e-mail: service@msailabs.com





#### ovamentari Stales Arabyncai, inc

PARTED A PERCENT OF LOR Weisn For Document Dionville, PA 19341

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJJ6 Matrix: Solid

Ai p ::Al litur 941급공 ate Reported 2/09/--Miscard Date: 33/11/98 Date Submitted: 01/26/98 Date Sampled: 12/31/98

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	100	% Passing	0.1
	No. 40 Seive	7.4	% Passing	0.1
	No. 200 Seive	1.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.61		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

> Respectfully Submitted, Reviewed and Approved by:

Scott Fraser

Project Manager

Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msailabs.com





Attn: Mr Kyle Clay

Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJF8 Matrix: Solid

Al or 9448
DBAI from 9448
Date Reported 2/09/-Discard Date: 03/11/m
Date Submitted: 01/26/98
Date Sampled: 01/02/98

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	99.7	% Passing	0.1
	No. 40 Seive	14.9	% Passing	0.1
	No. 200 Seive	1.5	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.60		0.001

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This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

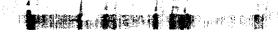
Respectfully Submitted, Reviewed and Approved by:

W. Scott Fraser Project Manager

10 Years of Quality Service

Corporate Office
1645 West 2200 South, Salt Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278
e-mail: service@msailabs.com







#### when a r stales Analytical, etc.

Back March 18 . Je Welsh (c.) Lichville 174

Attn: Mr Kyle Clay

Project: WHC/TMA 10985-001-001 9999-000

Sample ID: BOMJH1 Matrix: Solid

Al sp f All limus ) 13 late Reported 2 19/-Discard Date: (3, 11/5% Date Submitted: 01/26/98 Date Sampled: 01/03/98

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	★ Passing	0.1
	No. 4 Seive	97.3	% Passing	0.1
	No. 40 Seive	14.3	% Passing	0.1
	No. 200 Seive	2.1	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.56		0.001

 $A_{\alpha} = -\alpha A_{\alpha} + \beta A_{\alpha} G$ 

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

> Respectfully Submitted, Reviewed and Approved by:

Fraser

Project Manager







JEBNISA BIOLISTS 208 Weish Powe Lionville PA

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJK2 Matrix: Solid

Α. 2 - 18 U) 2-09/ ate Pepor ed 3/11/5h Date: Date Submitted: 01/26/98 Date Sampled: 01/05/98

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	100	% Passing	0.1
	No. 40 Seive	100	% Passing	0.1
	No. 200 Seive	0.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.10		0.001

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Respectfully Submitted, Reviewed and Approved by:

Project Manager



Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msallabs.com





Section 1995 September 1995 . Te Welso De Liphyille, PA

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001-001 9999-000

Sample ID: BOMJK5 Matrix: Solid

A 1., 481 ate Reported 1.09/-53/11/98 Discard Date: Date Submitted: 01/26/98 Date Sampled: 01/05/98

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	100	% Passing	0.1
	No. 40 Seive	3.6	% Passing	0.1
	No. 200 Seive	1.5	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.64		0.001

Contract Contra

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

> Respectfully Submitted, Reviewed and Approved by:

W. Scott Fraser

Project Manager



Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msailabs.com





CHANGE Brown of a

JOH Welst Police o Dionville FA 19941

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985 001-001-9999-000

Sample ID: BOMJJ9 Matrix: Solid

A MAL Hour 3-48 ate Perorred 3 09/ 4 3/11/35 Discard Date: Date Submitted: 01/26/98 01/05/98 Date Sampled:

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	100	% Passing	0.1
	No. 4 Seive	99.9	% Passing	0.1
	No. 40 Seive	15.8	% Passing	0.1
	No. 200 Seive	3.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.63		0.001

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

> Respectfully Submitted, Reviewed and Approved by:

Scott Fraser

Project Manager

Quality

Corporate Office 1645 West 2200 South, Salt Lake City, Utah 84119 801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278 e-mail: service@msailabs.com







#### ivio en a le states Antalytical, inc.

The words of the

PECEA Ent 1 to 108 Welsh foot olda lionville PA 19341

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985 001 001 9999-000

Sample ID: BOMJD3 Matrix: Solid

. A.	- P.	1
MBAI	Group .	9448
Late	Reported	12/09/9
Disca	ard Date:	03/11/98
Date	Submitted:	01/26/98
Date	Sampled:	12/30/97

Collected by:

Purchase Order: L01187

Project No.:

Test	Analysis	Results as Received	Units	Limit of Ouantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	l Inch Seive	74.0	<pre>% Passing</pre>	0.1
	No. 4 Seive	44.0	% Passing	0.1
	No. 40 Seive	3.7	% Passing	0.1
	No. 200 Seive	1.6	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.57		0.001

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> Respectfully Submitted, Reviewed and Approved by:

W. Scott Fraser

Project Manager







-ECRA Entractions to

108 Welsh 100 Pear Lionville PA 994

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001-001-9999-000

Sample ID: BOMJC7
Matrix: Solid

TAL ST 4 48
TOAL SHOUL 9-48
Date Reported 2/09/V
Discard Date: 33/11/98
Date Submitted: 01/26/98
Date Sampled: 12/29/97

Collected by:

Purchase Order: L01187

Project No :

		Results		Limit of
Test	Analysis	as Received	Units	Quantitation
9889	Gradation Test, sw, D-422			
	Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	1 Inch Seive	89.3	% Passing	0.1
	No. 4 Seive	74.5	% Passing	0.1
	No. 40 Seive	1.6	% Passing	0.1
	No. 200 Seive	0.4	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.56		0.001

tion pointly of the

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted, Reviewed and Approved by:

N. Scott Fraser

Project Manager

10 Years of Quality Service

Corporate Office
1645 West 2200 South, Sait Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278
e-mail: service@msailabs.com







#### Wom an craiss Analytical The

LE BA En. Lements LES Weish Poet File: L'onville PA 1841

Attn: Mr. Kyle Clay

Project: WHC/TMA 10985-001 001-9999-000

Sample ID: BOMJK8 Matrix: Solid

Collected by:

Purchase Order: L01187

Project No ::

Test	Analysis	Results as Received	Units	Limit of Quantitation
9889	Gradation Test, sw, D-422 Method: ASTM D-422-1140			
	12 Inch Seive	100	% Passing	0.1
	4 Inch Seive	100	% Passing	0.1
	l Inch Seive	80.8	% Passing	0.1
	No. 4 Seive	21.3	% Passing	0.1
	No. 40 Seive	0.5	% Passing	0.1
	No. 200 Seive	ND	% Passing	0.1
9804	Specific Gravity, ASTM, sw Method: ASTM D-854-92	2.46		0.001

ND - Not detected at the limit of quantitation

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted, Reviewed and Approved by:

W. Scott Fraser

Project Manager



Corporate Office
1645 West 2200 South, Salt Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278
e-mail: service@msailabs.com



Bechtel Hanford	l Inc.	CHA	IN OF CUSTOI	Y/SAM	IPLE AN	VALYSI	S REQ	UEST			B98-004-1	3 Page	<u>1</u> of <u>1</u>
Collector R. Fahlberg/D. St. John			Company Contact Curt Wittreich	Tele 31	phone No. 72-95 <b>8</b> 6			Project Co KOERN	ordinator ER, CC	In the	Data Turnarous		
Project Designation 216-B-2-2 Ditch - Soil		S	ampling Location 200 East					SAF No. B98-004				5 Days	, 
Ice Chest No. 844		<b>F</b>	icid Logbook No. EL-1281		_			Method of Fed. Ex.					
Shipped To TMA/WESTON			Offsite Property No. AGS	200				Bill of Lad	ing/Air Bill N	No.			
POSSIBLE SAMPLE HAZA			Preservation	None	None	None	None						
# 80,000 dpmp	1, < 0.5 ml	t spoon	Type of Container	G/P	#G	#G	Metal						
			No. of Container(s)	1	1	1	l ————————————————————————————————————						ļ
Special Handling and/or Stor	nge		Volume V	7 2kg Luter	60ml	60ml	400g	_					<u> </u>
•	SAMPLE AN	alysis SDG	H0129	See item (1) in Special   Instructions	Activity Scan	Soil Cation Exchange Capacity - 9000	Moistare Content - D2216						
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Refer (Local Refer)	Date/Time	Received By Received by 0	Date/Tim		·	PS   96		15.51	<b>/</b> `	_		0 - A - DS -	Water Oil Air Drum Solids Drum Liquids
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# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD

RFW LOT # :9801L019 DATE RECEIVED: 01/08/98 PREP # COLLECTION EXTR/PREP ANALYSIS RFW # CLIENT ID /ANALYSIS BOMJJ6 01/27/98 01/28/98 \* MOISTURE 007 S 98L\\$018 12/31/97 S CATION EXCHANGE CAPA 007 98LCE001 12/31/97 02/03/98 02/06/98 S 12/31/97 SUB-OUT TEST FOR SUB 007 BOMJF8 \* MOISTURE 800 S 98L%S018 01/02/98 01/27/98 01/28/98 CATION EXCHANGE CAPA 800 98LCE001 01/02/98 02/03/98 02/06/98 01/02/98 SUB-OUT TEST FOR SUB 008 BOMJH1 \* MOISTURE S 98L%S018 01/03/98 01/27/98 01/28/98 009 CATION EXCHANGE CAPA 009 S 98LCE001 01/03/98 02/03/98 02/06/98 SUB-OUT TEST FOR SUB 009 S 01/03/98 BOMJK2 % MOISTURE 010 S 98L%S018 01/05/98 01/27/98 01/28/98 S CATION EXCHANGE CAPA 010 98LCE001 01/05/98 02/03/98 02/06/98 SUB-OUT TEST FOR SUB 010 S 01/05/98 BOMJK5 % MOISTURE 011 98L%S018 01/05/98 01/27/98 01/28/98 CATION EXCHANGE CAPA 011 S 98LCE001 01/05/98 02/03/98 02/06/98 SUB-OUT TEST FOR SUB 011 S 01/05/98 BOMJJ9 \* MOISTURE 012 98L%S018 01/05/98 01/27/98 01/28/98 CATION EXCHANGE CAPA 012 S 98LCE001 01/05/98 02/03/98 02/06/98 SUB-OUT TEST FOR SUB 012 S 01/05/98 **BOMJD3** % MOISTURE 013 S 98L%S018 12/30/97 01/27/98 01/28/98

1 1

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD

DATE RECEIVED: 01/08	3/98			1	RFW LOT # :9	801L019
CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CATION EXCHANGE CAPA SUB-OUT TEST FOR SUB	013 013	s s	98LCE001	12/30/97 12/30/97	02/03/98	02/06/98
BOMJC7						
* MOISTURE	014	s	98L%S018	12/29/97	01/27/98	01/28/98
CATION EXCHANGE CAPA SUB-OUT TEST FOR SUB	014 014	S	98LCE001	12/29/97 12/29/97	02/03/98	02/06/98
LAB QC:						
CEC TOTAL	LC1 BS	s	98LCE001	N/A	02/03/98	02/06/98
CEC TOTAL CATION EXCHANGE CAPA	LC2 BSD MB1	s s	98LCE001 98LCE001	N/A	02/03/98	02/06/98
WILLIAM BRUIDEN CAPA	LIDT	9	POTICECUT	N/A	02/03/98	02/06/98

| |

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD

DATE RECEIVED: 01/10	/98				RFW LOT # :9	801L062
CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOMJK8						
* MOISTURE	001	s	98L%S018	01/07/98	01/27/98	01/28/98
CATION EXCHANGE CAPA	001	S	98LCE001	01/07/98	02/03/98	02/06/98
SUB-OUT TEST FOR SUB	001	S		01/07/98		
AB QC:						
<del></del>						
CEC TOTAL	LC1 BS	S	98LCE001	N/A	02/03/98	02/06/98
CEC TOTAL	LC2 BSD	s	98LCE001	N/A	02/03/98	02/06/98
CATION EXCHANGE CAPA	MB1	S	98LCE001	N/A	02/03/98	02/06/98

RECRA L	abNet	Use	Only
ORA	11	0	19



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DS - Drum Solids	003	Bom:			1	1	1	13/2/52								1		X	X	X	X	7	$\neg$
DL - Drum Liquids	007	Bom					7		093									X	X	X	X		
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## Mountain States Analytical, Inc.

The Quality Solution

January 30, 1998

Mr. Kyle Clay RECRA Environmental, Inc. 208 Welsh Pool Road Lionville, PA 19341

Reference:

Project: WHC/TMA 10985-001-001-9999-000

MSAI Group: 19449

Dear Mr. Clay:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

BOMJD6

BOMJH1

BOMJK2

BOMJK5

All holding times were met for the tests performed on these samples.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

W. Scott Fraser

Project Manager

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Carried St. Jan.

PECRA Enviromental of 208 Welsh Pool Road Lionville, PA 19341 MSAI Group: .9449 Date Reported: 01/30/98 Date Received: 01/26/98

Attn: Mr. Kyle Clay

Purchase Order: L01187

Project: WHC/TMA 10985-001-001-9999-000

Project No.:

Test Analysis	Results as Received	Units	Limit of Quantitation
rest Analysis	ab Received	011103	Quantitation
Sample:74578 - BOMJD6 2231 Bulk Density, sw, D-2937	115	ibs/cu ft	0.6
Sample:74579 - BOMJH1 2231 Bulk Density, sw, D-2937	93.6	lbs/cu ft	0.6
Sample:74580 - BOMJK2 2231 Bulk Density, sw, D-2937	104	lbs/cu ft	0.6
Sample:74581 - BOMJK5 2231 Bulk Density, sw, D-2937	90.5	lbs/cu ft	0.6

Test Method Summary: 2231 - ASTM D 2937



This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted, Reviewed and Approved by:

W. Scott Fraser / Project Manager

Southwest States Region 6223 Bayonne, Spring, Texas 77389 281-320-2842 • FAX 281-320-0989 e-mail: gbrewer@maailabs.com

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10 Years of Quality Service

Corporate Office
1645 West 2200 South, Sait Lake City, Utah 84119
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-8278
•-mail: service@msailabs.com